



Comparing different methods to assess baseflow contribution to streamflow in a small mountain Mediterranean basin (Vallcebre, Eastern Pyrenees).

F. Gallart (1), J. Latron (2), P. Llorens (1) and A. Butturini (3)

(1) Institute of Earth Sciences 'Jaume Almera' (CSIC), Barcelona, (2) Escola Tècnica Superior, Universitat de Girona, (3) Facultat de Biologia, Universitat de Barcelona.
(fgallart@ija.csic.es)

Field observations at the Can Vila catchment (0.56km²) demonstrated that saturation overland flow and subsurface flow (shallow groundwater flow) are the main runoff generating mechanisms. Four different methods were compared for the decomposition of streamflow in two components, that consist on the use of: 1) water table depth records during the events and the observed relationship between water table depth and discharge during recession periods; 2) DOC as a conservative tracer; 3) stream water temperature, compared with antecedent stream temperature and rainfall temperature; and 4) model simulations made both with a customary version of TOPMODEL and with TOPBAL, a TOPMODEL version which allows two-way exchanges between the saturated and the root-unsaturated stores.

The uncertainty associated with the decomposition of the hydrograph was taken into account for all the methods. The models were conditioned not only on discharge, but also on recession analysis as well as on the relationships between recession discharge and the extension of saturated areas.

The results showed that even if there is some consistency among the different results, each method suggests a different within-flood dynamics of the subsurface component, illustrating the complexity of the processes as well the strengths and weaknesses of the modelling approaches tested.